

## Phenacoccus sphagni (Green) in Holland

by

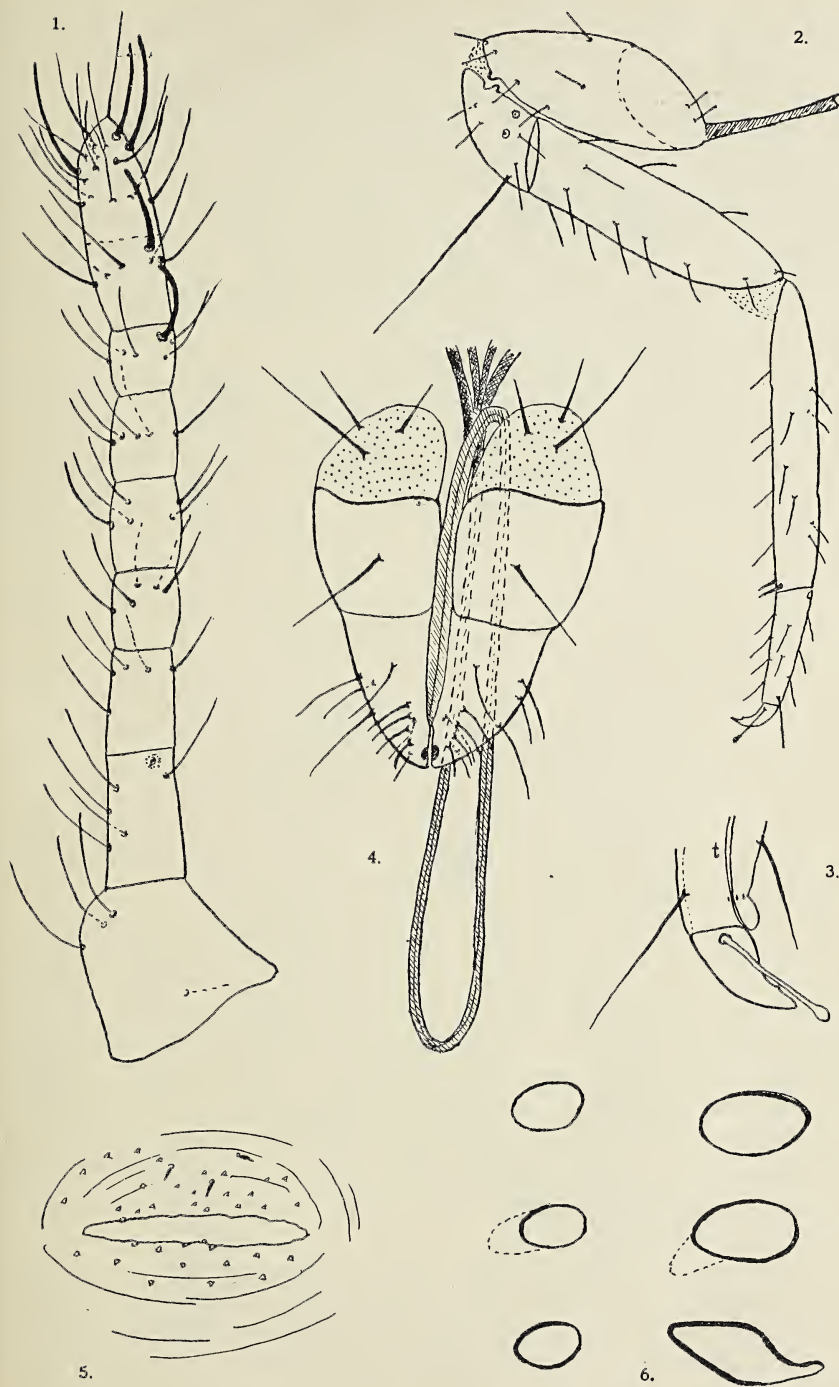
A. REYNE

In 1947 I received from Mr. D. HILLE RIS LAMBERS several slides with scale insects which he had found in Holland, while collecting aphids for his own studies. Among these scale insects there was a specimen collected near Bergen op Zoom (15.VI.1941), where it was found on the upper sides of the leaves of the grass *Molinia coerulea*. During an excursion of the Dutch Entomological Society at Norg Mr. HILLE RIS LAMBERS collected several specimens of this species on the roots of *Molinia coerulea* (4.VII.1948). The distance between Bergen op Zoom (North Brabant) and Norg (Drente) is about 225 kms as the crow flies.

As I failed to identify the specimen from Bergen op Zoom with any *Phenacoccus*-species described from Europe, it was submitted to Dr. W. J. HALL (London) for identification. Dr. HALL informed me that it was a typical *Phenacoccus*, though the antennae were 8-segmented, with only an indistinct pseudo-division of the apical segment. He had compared the specimen with *Ph. graminicola* Leonardi (a co-type from Italy, and a specimen from France). Dr. HALL thought that my specimen was close to *Ph. graminicola*, though the legs and antennae were somewhat shorter, and the antennae only indistinctly 9-segmented. Some months later I could examine 2 specimens of *Ph. graminicola* from Southern France by the courtesy of Dr. A. BALACHOWSKY (Paris). I came to the same conclusion as Dr. HALL, but it struck me that the large circulus of *Ph. graminicola* (about  $80 \times 30 \mu$ ) was wanting in the Dutch *Phenacoccus*-species; I believed to see faintly 2 minute circuli on the first and second abdominal segments in the Dutch specimens, similar to those of *Ripersia mesnili* Balach.

Several years later (in 1954) when I examined the specimens from Norg and Bergen op Zoom again, these circuli were distinctly observed, as the prepared specimens had become quite transparent.

I was now convinced that the Dutch specimens belonged to an unknown species of *Phenacoccus* which I described as a nov. spec. When the MS. was completed, the descriptions of some *Phenacoccus*-species with 8-segmented antennae, found on grasses, were examined again. This time I came across a supplementary description of *Pseudococcus sphagni* Green (GREEN, *Entom. mo. Mag.* 1920 : 119—120). GREEN's original description of this insect (*Entom. mo. Mag.* 1915 : 178—179) is too concise to recognize his new species, and in the second description nothing is stated about circuli or wax pores (except the trilocular ones). The abnormal antennae, the cerarii, and the occurrence of *P. sphagni* on grasses on wet soil reminded me of my own specimens. By the courtesy of Dr. D. J. WILLIAMS (of the Commonwealth Institute of Entomology), and the authorities of the British Museum, I could examine a slide with 3 specimens of GREEN's *P. sphagni*. It was now clear that the Dutch specimens belonged to the same species, though not found in the nests of *Formica picea* Nyl. GREEN's specimens had been collected by the ant-specialist H. S. J. K. DONISTHORPE in the New Forest (Hants, England) on the roots and stems of grasses, and also loose in the galleries, in the nests of *Formica picea* in a *Sphagnum*-bog (22.VII.1914, and 18.VII.1918). This is, as far as I know, the only locality from which GREEN's species is known



at present. Mr. HILLE RIS LAMBERS informs me that the specimen from Bergen op Zoom was found on the leaves of *Molinia coerulea*, half shaded by *Salix aurita*, growing on the border of a little fen; there was some *Sphagnum* in the neighbourhood but very little on the find-spot. *Formica picea*, though present in the environments of Bergen op Zoom, was wanting there. A *Myrmica* sp. was visiting aphids on the willow. At Norg a *Myrmica* sp. was seen near the coccids, but *Formica picea* was absent there. He once examined a nest of the latter ant near Gerritsflesch (Guelderland), but it contained neither aphids nor coccids.

In September 1957 Mr. E. T. G. ELTON examined three nests of *Formica picea* and two of *Myrmica* sp. for me near the Deelse Was, a little heath-lake about 10 kms north of Arnhem. He also examined the roots of plants of *Molinia* growing there, but failed to find *Ph. sphagni*.

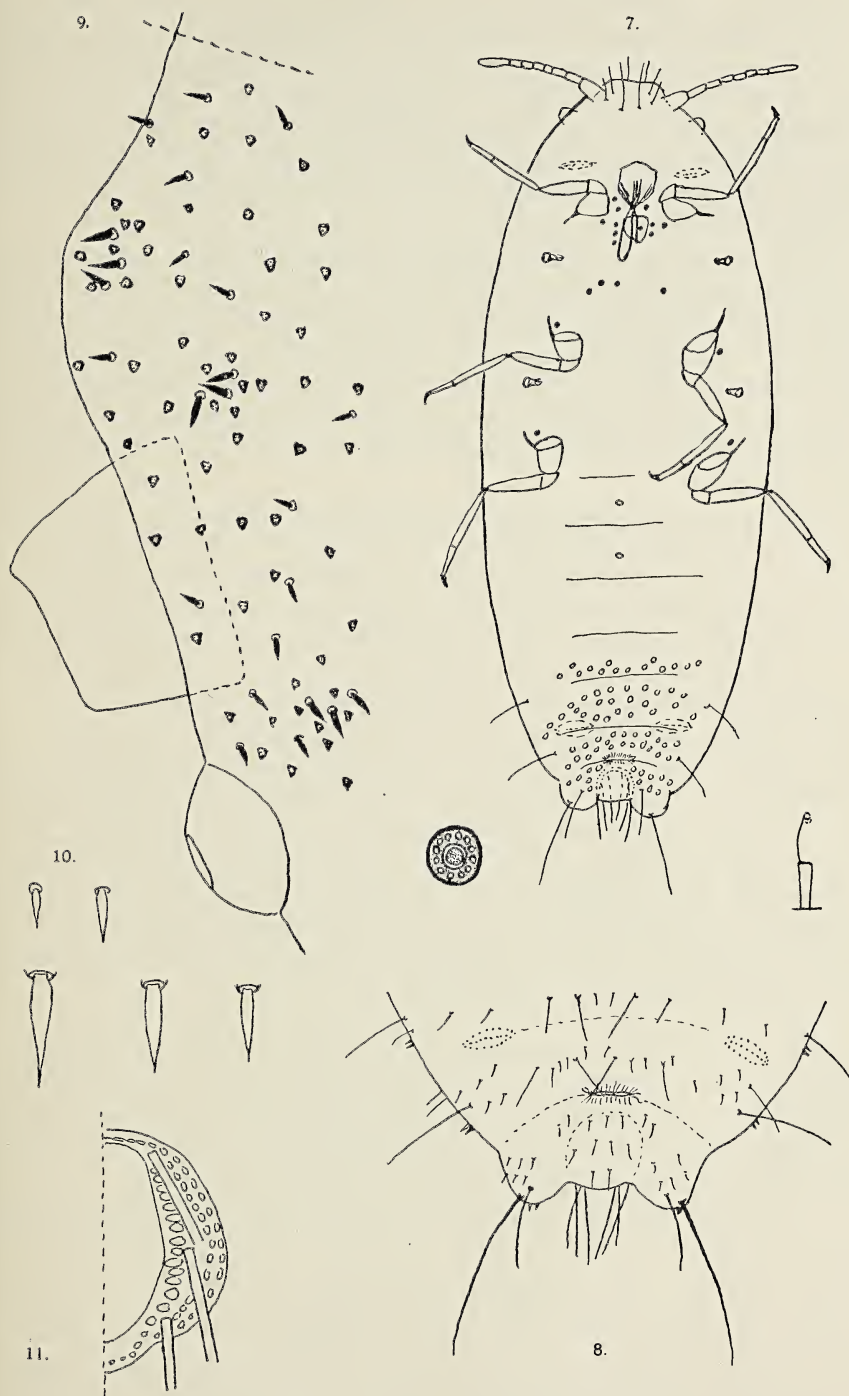
*Phenacoccus sphagni* (Green) is redescribed below. The description is based on 6 adult females from Holland, and the 3 specimens of GREEN, given in loan by the British Museum (slide labelled "*Pseudococcus sphagni* Green. From nest of ant, *Formica picea*, New Forest, Hants, coll. Donisthorpe VII 1918", and numbered: B.M.1940.180). GREEN's specimens were probably mature females; they measure  $4 \times 2$  mm on the slide. All measurable features of the 9 examined specimens were tabulated but no noticeable differences were found, except that most Dutch specimens were younger and smaller than those from England. The larval stages and the adult male are still unknown.

**Habit.** Colour pinkish or dull redbrown. Dimensions (on the slide) from  $2.0 \times 0.8$  to  $4.0 \times 2.0$  mm. The specimens from Norg had 3—4 pairs of indistinct wax projections at the anterior, and 3 pairs at the posterior end of the body; the dorsum was slightly dusted with wax. GREEN (1920) observed that the living specimens which he received, made large ovisacs; the largest was 7 mm long and filled with pinkish eggs. Ovisacs were absent in the living specimens which I received from Norg (4.VII.1948); only one of the prepared specimens had some well-developed eggs in the interior of the body.

**Antennae** usually 8-segmented, but the apical segment may show an indistinct division in two parts (fig. 1). Among 16 antennae examined there was an indication of such a pseudo-division in 8 antennae; it was always located just above the sensory hair in the middle of the apical segment. Three antennae of the Dutch specimens seemed to be 7-segmented; in one the 7th and 8th segments were largely fused, in 2 others the segments IV and V. Length of antennae 375—400  $\mu$ . Number of hairs on the antennal segments: I 4, II 3—5, III 5—6, IV 3—5, VI 5, VII 5 and 1 sensory hair, VIII 17—18 ordinary hairs and 4 sensory hairs (1 in the middle of the segment, and 3 near the top). The sensory hairs near the top of segment VII, and that on the middle of the apical segment are always distinctly developed.

**Legs** show no special features (fig. 2). There is a denticle on the claw. The ungual digitules are knobbed, the tarsal ones acute (fig. 3). The femur and the tibia are about of the same length (ca. 200  $\mu$ ), and the tarsus (without claw) half as long (80—90  $\mu$ ). The following number of hairs were counted on the different segments of the hind leg: coxa 8—9, trochanter 4—5 (of which one very long), femur 12—18, tibia 12—16 (and 2 spine-like hairs at the distal end), tarsus 8—10 (and 2 hair-like tarsal digitules).





**Labium** 2-segmented, short, bluntly pointed (fig. 4); length about equal to width at base (ca.  $85\ \mu$ ), or slightly less. The rostral loop is short, reaching at most the line of the anterior spiracles, and projecting beyond the tip of the labium over a distance about equal to its length. Observed from the ventral side the labium shows 1 pair of hairs on the basal segment, and 10 pairs on the apical segment. Further 2 faintly sclerotized plates are observed at the base of the labium, each with 3 hairs. There is nothing peculiar in this setal pattern, as it is found in most *Pseudococcidae*.

**Dorsal surface.** Eyes, ostioles, and anal lobes' distinct, the latter especially in the younger specimens (figs. 7 and 5). The dorsum is provided with small lanceolate spines (fig. 10). It has a large number of trilocular pores, evenly spread over the surface. Tubular pores scarce, sometimes 1 or 2 on head, few on thorax, more on abdomen, especially on the posterior segments (fig. 7); dimensions  $8-10 \times 2-3\ \mu$ . Multilocular and quinelocular pores are wanting on the dorsal surface. Anal ring (fig. 11) with 3 rows of pores, and 6 anal hairs (length  $100-125\ \mu$ ).

The anterior end of the body shows usually 6-8 pairs cerarii, of which the third pair is placed about opposite to the eye (fig. 9). The 4 foremost cerarii have as a rule 3 lanceolate spines, and are provided with 5-6 trilocular pores, sometimes 8. In one case the 8th cerarius, opposite to the posterior spiracle, was still recognizable (2 spines, 2 pores). At the posterior end of the body usually 5-7 cerarii are observed with only 2 lanceolate spines (fig. 10) and 4-8 trilocular pores. In one of my specimens the cerarius on the anal lobe has 3 spines and about 10 pores; in another specimen the ultimate cerarius has 12-15 pores, and the penultimate one 12-13 pores. It is sometimes difficult to decide which spines and which pores belong to a particular cerarius. The cerarii in the middle part of the body are wanting; sometimes single spines with an adjacent pore seem to represent the rest of a cerarius. The foremost and hindmost cerarii are always well developed; these had apparently given rise to the wax projections at the anterior and posterior end of the body, as observed in the specimens from Norg. In one of these specimens the cerarii were placed on faintly sclerotized plates, but these plates were not visible in the other specimens.

**Ventral surface.** Only hairs present (figs. 7 and 8); small spines, as observed on the dorsum, wanting. The medioventral hairs are rather long, on the head  $80-120\ \mu$ , on the abdomen  $50-100\ \mu$ . Apical hair on anal lobe  $200-250\ \mu$ , accessory hair  $100-125\ \mu$ . The abdominal segment preceding the anal lobe bears at its sides a prominent hair, length  $100-130\ \mu$  (fig. 8).

Four types of wax pores are observed on the ventral surface. The trilocular pores are regularly scattered as on the dorsum, but less numerous. Some stellate quinelocular pores are observed near the labium, and between the labium and fore legs. Sometimes single stellate pores are present near the base of the middle and hind legs (fig. 7). The total number of stellate pores observed in each of the 9 examined specimens varied from 16-23. Multilocular pores are numerous on the posterior abdominal segments, around the genital fissure. Forward they only reach the second or third segment before the genital fissure (fig. 7). Tubular pores scarce on thorax, more on abdomen, especially on the posterior segments;

shape and dimensions similar to those on the dorsal side (fig. 7). Dimensions: trilocular pores  $3\ \mu$ , quinquelocular pores  $4\text{--}5\ \mu$ , multilocular pores  $7\text{--}8\ \mu$  (with 12 loculi).

A special feature of *Pb. sphagni* (Green) is the presence of 2 very small but distinct circuli on the first and second abdominal sternite, similar to those of *Ripersia mesnili* Balach. (fig. 6 and 7). The foremost circulus has a diameter of  $8\text{--}13\ \mu$ , the second one of  $10\text{--}22\ \mu$ ; in every specimen the posterior circulus was the largest of the two. If the cerarii on the anal lobe are taken as the first pair, the anterior circulus is found about in the line of the 7th pair, and the posterior circulus in the line of the 6th pair of cerarii. In the 6 specimens from Holland the circuli were quite distinctly observed. This was only the case in one of GREEN's specimens; in a second one only the posterior circulus was visible, but it had shifted from its proper place, and was distorted. This was probably due to faults of the preparation. The abdomen was faltered, and pressed flat, so that even the genital fissure was invisible, though quite distinct in all Dutch specimens prepared by myself.

**Summary.** The adult female of *Pb. sphagni* (Green) can be recognized by the following characters. A pinkish *Phenacoccus* living on grasses on wet soil; dimensions when full-grown about  $4 \times 2\text{ mm}$ . Slightly dusted with wax, with rudimentary wax projections at the anterior and posterior end of the body. Mature females with an ovisac with pinkish eggs. Sometimes found in the nests of *Formica picea*.

In a microscopical preparation this species can be recognized by the presence of 2 minute circuli (about  $10\text{--}20\ \mu$ ) on the first and second abdominal segments. Antennae usually 8-segmented, but often with a pseudo-division in the apical segment; 4th and 5th segments sometimes partly fused. In the anterior part of the body usually 6—7 pairs of cerarii, of which the 3—4 foremost ones have commonly 3 spines. In the posterior part of the body usually 5—7 pairs of cerarii with 2 spines. Cerarii in the middle part of the body wanting. Four types of wax pores, trilocular and tubular pores on dorsum and venter, quinquelocular and multilocular pores only on the ventral side. Tubular pores scanty on thorax, more on abdomen, especially on the posterior segments. About 20 quinquelocular pores around the labium, sometimes single pores at the base of the middle and hind legs. Multilocular pores numerous around the genital fissure, extending forward to the second or third segment before that fissure. Ostioles and anal lobes distinct, especially in younger specimens. Anal lobe with a long hair ( $200\text{--}250\ \mu$ ) and an accessory hair which is about half as long. Rather long hairs in the medio-ventral area between the antennae ( $80\text{--}120\ \mu$ ). There is a long hair at the sides of the abdominal segment preceding the anal lobes ( $100\text{--}120\ \mu$ ).

#### Explanation of figures

- 1) Antenna ( $\times 300$ ). The sensory hairs are drawn too thick to show them clearly.
- 2) Hind leg ( $\times 200$ ).
- 3) Claw of the same leg ( $\times 630$ ); t is the tendon by which the claw is moved.
- 4) Labium with the rostral loop, seen from the ventral side ( $\times 430$ ). The faintly sclerotized plates at the base of the labium are stippled.
- 5) Posterior ostiole ( $\times 300$ ).



- 6) Circuli; at left the anterior circulus, at right the posterior one ( $\times 630$ ). The 2 upper pairs are taken from specimens from Norg (Holland), the lower pair from a specimen from the New Forest (England). The posterior circulus in the last mentioned specimen was apparently distorted during preparing.
- 7) Young adult female, seen from the ventral side ( $\times 45$ ). The quinquelocular pores are indicated by black dots, the multilocular pores by open circles. The position of the 2 minute circuli is shown. Only some prominent hairs in the frontal area, and at the posterior end of the abdomen are drawn; the others are omitted. At the foot of the figure: at left a multilocular pore ( $\times 1000$ ), at right a tubular pore ( $\times 630$ ) from the abdomen, seen from the side.
- 8) Posterior end of fig. 7 ( $\times 100$ ) to show the different hairs; wax pores omitted. The genital fissure, and the (dorsal) ostioles are indicated; of the 3 posterior cerarii only the tips of the spines are visible.
- 9) Cerarii in the frontal area of the dorsum ( $\times 430$ ); the basal segment of the antenna and the eye are shown. The mediodorsal line is indicated by a broken line.
- 10) Lanceolate spines from the dorsal side ( $\times 630$ ). Upper row, from left to right: a small spine from the middle of the dorsum, and a spine from the ocular cerarius. Lower row, from left to right: cerarian spines from the ultimate, penultimate, and antepenultimate cerarius.
- 11) Half of anal ring ( $\times 430$ ); only the basal part of the anal hairs is drawn.

Amsterdam-O., Zoölogisch Museum, Zeeburgerdijk 21.

Catalogus Faunae Austriae, onder leiding van Prof. Dr. Hans STROUHAL. Uitgave van de Akademie der Wissenschaften te Wenen.

Van deze Catalogus zijn de volgende delen in de Bibliotheek :

STROUAL, H., Scorpionidea, Palpigradi.

BEIER, M., Pseudoscorpionidea.

EBNER, E., Saltatoria, Dermaptera, Blattoidea, Mantoidea.

ZIMMERMANN, S., Hymenoptera-Tubulifera: Cleptidae, Chrysidae.

SMIT, F. G. A. M., Siphonaptera.

Bij elke soort wordt de verspreiding in Oostenrijk naar grotere gebieden opgegeven, benevens de globale verspreiding van de soort buiten Oostenrijk. Ongetwijfeld een faunistisch belangrijke publicatie. — KR.

The Larval Trombiculid Mites of California (Acarina: Trombiculidae). *Univ. of Calif. Publi. in Entom.*, 11 (1) : 1—116, pl. 1—26. Univ. of California Press, Berkeley 4, Cal., 1956, \$ 2.—.

In deze goed doorwrochte publicatie worden 56 larven beschreven en met hun meest typische kenmerken in duidelijke tekeningen afgebeeld. Na de uitgebreide onderzoeken die reeds in het Australaziatische gebied zijn verricht, wordt nu ook de fauna van Noord-Amerika beter bekend. Hoeveel soorten van deze Trombiculidae op aarde rondlopen, is niet te schatten. Hier worden weer 15 nieuwe beschreven. Helaas zijn haast al deze dieren slechts als larve bekend; het geld, dat nodig zou zijn voor het op behoorlijke schaal kweken van adulti, wordt evenwel opgemaakt voor niet-acarologische doeleinden, welke men belangrijker acht. In medisch opzicht zijn deze vaak hinderlijke en ziekteoverbrengende mijten bij ons gelukkig niet van belang. — G. L. VAN EYNDOVEN.

Thysanoptera. Ondergetekende zou gaarne alcoholmateriaal van Nederlandse Thysanoptera willen ontvangen. Buisjes met alcohol worden desgevraagd toegezonden en verzendkosten zullen worden vergoed.

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